

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

- 1 1. (Original) A method for computing distances between a received point and four
2 points in a two-dimensional grid with a constellation representing a number of bits
3 greater than three, wherein each of the four points belong to a unique coset in the
4 constellation, the method comprising:
5 determining a first point on a grid nearest to the received point;
6 computing a second point closest to the received point inside a specified area;
7 computing a third, fourth, and fifth point, wherein each point is a member of a
8 different coset and each point is the closest point in its coset to the received point; and
9 computing a distance from the received point to each of the second, third, fourth,
10 and fifth points.
- 1 2. (Original) The method of claim 1 further comprising after the first computing,
2 recomputing the second point if the second point is invalid.
- 1 3. (Original) The method of claim 2, wherein the second point is invalid if it is outside of
2 the constellation.
- 1 4. (Original) The method of claim 1, wherein the first point can be determined by
2 evaluating:
3 $\text{round}((R_x + iR_y - 1 - i)/2^2 + 1 + I,$
4 wherein R_x and R_y are two-dimensional components of the received point, i is the

5 imaginary number, and round(.) is an operator that returns an integer number closest to
6 a value provided to it.

1 5. (Original) The method of claim 1, wherein the number of bits is an even value,
2 wherein the received point can be expressed in two-dimensional components Rx and
3 Ry, and wherein the first computing comprises:
4 determining if Rx and Ry lie inside a square specified by the number of bits; and
5 computing two-dimensional components of the second point based on the
6 second determining.

1 6. (Original) The method of claim 5, wherein the second determining comprises:
2 setting Cx = 1 if Rx lies inside a boundary of the square, else Cx = -1;
3 setting Cy = 1 if Ry lies inside a boundary of the square, else Cy = -1;
4 and wherein the fourth computing comprises
5 setting Ax = sign(RGx) * MAX_{XY} if Cx = -1, else Ax = RGx; and
6 setting Ay = sign(RGy) * MAX_{XY} if Cy = -1, else Ay = RGy,
7 wherein Ax and Ay are two-dimensional components of the second point, RGx and RGy
8 are two-dimensional components of the first point, MAX_{XY} is value describing the size of
9 the square and can be computed by $2^{\text{number of bits}/2} - 1$.

1 7. (Original) The method of claim 5, wherein the second computing comprises:
2 computing an intermediate value, d, wherein d = the received point – the second
3 point;
4 setting the third point = the second point + Cx * sign(dx) * 2;
5 setting the fourth point = the second point + i * Cy * sign(dy) * 2; and

6 setting the fifth point = the second point + $2(C_x * \text{sign}(dx) + i * C_y * \text{sign}(dy))$,
7 wherein C_x and C_y are values specifying if the two-dimensional components of the
8 received point lie inside a boundary of the square and dx and dy are two-dimensional
9 components of d .

1 8. (Original) The method of claim 5, wherein the third computing comprises computing
2 a Euclidean distance from the received point to each of the second, third, fourth, and
3 fifth points.

1 9. (Original) The method of claim 8, wherein each of the second, third, fourth, and fifth
2 points belong to a unique coset.

1 10 – 22 Cancelled

1 23. (Original) The method of claim 1, wherein the method can be used to decode a
2 received point in a communications system.

1 24. (Original) The method of claim 23, wherein the communications system is an
2 asymmetric digital subscriber line (ADSL) compliant system.

25 - 27. Cancelled.